KERATITIS VESICULOSA WITH SECONDARY GLAUCOMA.

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This form of keratitis has already been sufficiently well described by v. Graefe, Horner, and Schmidt, but the case which I am about to report has additional interest on account of the very unusual complication which followed. At the time when I saw it, I was not aware that any similar one had been published. I have, however, found two such observations recorded in literature. Inasmuch as these, so far as I know, are the only ones, I believe it will not be without interest to place them together with mine. The first case on record is by von Graefe.* He says that limited corneal infiltration (genuine circumscribed keratitis) has hardly any influence on the tension, as estimated by the touch, and this may explain why it is rarely, if at all, the cause of glaucoma. He had only once seen glaucoma following circumscribed keratitis, and briefly reports the case on account of its rarity.

A woman, 50 years of age, who had suffered for many years from eruptions on the extremities, and occasionally on her left cheek, applied at the clinic, in June, 1866, for an ophthalmia of about one week's duration. We found an old eczema behind the left ear, and an eczematous patch about the size of a four-groschen piece at the lower part of the left cheek, on both sides blepharadenitis, and finally the special cause of her application, a circumscribed infiltration of the left cornea. The latter presented typical characters. There was an opaque and somewhat swollen spot, measuring 1.5 mm., opposite the lower edge of the pupil; its centre was yellow and opaque, passed into a light gray towards the margin, and merged gradually into the healthy cornea; the centre also projected and presented a slight excoriation. The pupil was small; it dilated slowly on the use of atropine, owing to the existing irritation; the vision was quite

* Contributions to the Pathology and Treatment of Glaucoma, Archiv f. Ophth., xv., p. 108, and translation by Thos. Windsor, Royal London Ophth. Hosp. Reports, vol. vii., p. 65.

in proportion; the tension was not tested at first, as there seemed no reason for suspicion. The disease was unusually obstinate, which was attributed to the eczematous diathesis. This led to a more careful examination, and it was expressly determined in the fourth, and again in the sixth week, that there was no complication with disease of the internal structures; the tension was perfectly normal, not only within the physiological limits, it did not even reach the normal maximum, nor vary from that of the right eye. From this time, while the corneal disease remained perfectly stationary, there supervened a perfectly typical attack of subacute glaucoma. Paracentesis twice repeated had no permanent effect, and in the twelfth week from the commencement of the attack indistinctness of eccentrical vision on the nasal side necessitated iridectomy.

The operation was followed by the desired reduction of tension, and rapid disappearance of the obstinate corneal infiltration.

Graefe concludes that, as this is the only case in which he has noticed typical circumscribed corneal infiltration followed by glaucoma, it may well be imagined that the succession was accidental, or that both affections were due to the eczematous diathesis.

The second case was reported by Saemisch at a meeting of the Medical Section of the Society of the Lower Rhine, held in Bonn, March 21st, 1870.* He presented a patient who had suffered for five months from *keratitis vesiculosa*, and remarked that the case merited attention because it deviated from those put on record in two respects: *First.* Preceding the formation of the vesicle, there was an opacity of the cornea a few mm. long, arranged in long parallel or decussating stripes, formed in various layers of the cornea, similar to those described by Heyman, who supposes them to be opaque, or widened lymphatic corneal vessels. *Second.* When the disease was at its height, acute glaucoma supervened, for which iridectomy was performed with good result. Saemisch's conclusion is just the opposite to that of v. Graefe. He thinks that in this case we are entitled to suppose that glaucoma was not a casual complication, but that it was secondary to and induced by the corneal process.

I now come to my own case, which is as follows:

In August, 1873, a Jewess, of about 40 years of age, came to the Oph-

* Berliner Klinische Wochenschrift, No. 37, p. 449. 1870.

thalmic and Aural Institute. Her left eye had begun to trouble her only a day or two before. She complained of lachrymation, photophobia, and supra-orbital neuralgia. There was considerable circum-corneal injection. On oblique illumination a small, perfectly transparent vesicle of the cornea, about 1‴ in diameter, below and a little to the outer side of the middle of the pupil, was to be seen. It was surrounded by a circlet of infiltration which gradually shaded off into the healthy cornea. The central vesicle was quite prominent, and at first I thought that I had to deal with an ulcer, with hernia of Descemet's membrane. Upon more careful examination, however, this was determined not to be the case, and the diagnosis of *Keratitis vesiculosa*, or *true herpes of the cornea*, was made. The pupil was of normal size, responded well to light, and dilated under atropine.

The anterior chamber of normal depth; T.n.; F. complete; S. = $\frac{20}{50}$. Ophthalmoscopic examination discovered no abnormality of the fundus.

The treatment employed was instillations of atropine, warm applications, and pressure bandage. Two days later I saw the patient again at her house. There was no material change in the appearance of the eye, but the pain was more severe. Leeches to the temple were ordered, and the other treatment continued. I saw the patient only twice after this, at intervals of a few days, and each time I examined the interior of the eye with the opthalmoscope, as well as the tension, visual field and sight, and never found any indication of glaucoma. I then declined further attendance on account of the patient's obstinacy, but told her husband to take her to the clinic. This he did not do. I was, however, surprised to hear from Dr. Knapp that on Oct. 6th she presented herself at his office with absolute glaucoma. She was admitted to the Ophthalmic Institute, where I saw her again. The pupil was wide and immovable; anterior chamber very shallow; T. + 3; no perception of light, and illumination with the ophthalmoscope was impossible. The eye was still very painful. She had continued the use of atropine since I left her, but further than this had done nothing, although she had suffered severe pain all the while and sight was gradually abolished. A small opacity of the cornea marked the site of the vesicle. Dr. Knapp made a large peripheral iridectomy, merely with the view of relieving pain. The operation had the desired effect in reducing tension and relieving pain, but no influence upon vision.

The other eye was in all respects normal.

These three observations are certainly sufficient proof to warrant thein ference that there may have been a *causal* rather than a *casual* relation between the corneal and glaucomatous processes.

I am quite of the opinion that, in my case, the same conclusion must be arrived at as Saemisch came to in his, that is, that the glaucoma was the direct result of the corneal process. It is to be regretted that the opportunity of observing the course of the disease was wanting, and it cannot, therefore, be stated just when the glaucomatous process began.

In v. Graefe's case the symptoms of glaucoma set in about the twelfth week from the commencement of the attack, and in Saemisch's, when the disease of the cornea was at its acme, glaucoma supervened. It is difficult to state, in my case, whether the onset of the glaucoma was acute or not. I incline to the opinion, however, that it was sub-acute, as in v. Graefe's case.

As to the rôle which this form of keratitis may play in the ætiology of glaucoma, I have no theory of my own to offer, but I should like to call attention to the remarks made by *Max Schultze* (l. c.) in the discussion which followed the presentation of Saemisch's case.

He said that he had recently read a paper by SCHWEIGGER-SEIDEL, of Leipzig, *on the interstitial cavities* (Spalträume) of the cornea, and it seemed to him quite possible that the vesicles in question might be due to widening of these normal canals, which, according to the investigations of S.-S., show a great similarity to lymph capillaries. If the interstitial cavities of the cornea really communicate with lymph-vessels, the vesicles would have to be considered as ectasiæ of lymphatics. Schultze also referred to a paper by GUSTAVE SCHWALBE, on the lymphatic cavities of the eye, published in his *Archiv f. Mikroskopische Anatomie*, which contains a great many interesting observations concerning the communication of the anterior chamber, canalis Petiti, and the ciliary veins with lymph-vessels. These observations are apt to throw a new light upon the conditions which give rise to intra-ocular tension. In applying these observations to Saemisch's case, Schultze remarks that the fact of the vesicle of the cornea existing before the outbreak of the glaucoma, enhances the probability that the increase of intra-ocular tension might have been due to an impediment to the out-flow of lymph (perhaps to a valvular obstruction in the efferent lymph-vessels).

In conclusion, I would raise the question, whether in my case the long-continued use of atropine may not have had something to do with provoking the glaucomatous attack.